

TCA Overdose

Mechanisms of Toxicity:

- Anticholinergic effects: tachycardia, dilated pupils, dry skin, decreased bowel motility, decreased sweating, sedation, urinary retention, seizures
- Inhibition of neuronal reuptake of catecholamines: tachycardia, mild hypertension, seizures
- Fast Na channel blockade/cellular membrane depressant: myocardial depressant, cardiac conduction disturbances

Clinical symptoms typically occur 30-40 minutes after ingestion. Death usually occurs within a few hours after hypotension and QRS widening ensues. Dysrhythmias are rare

ECG Findings:

- Sinus tachycardia
- PR prolongation
- QRS prolongation
- QT prolongation
- Terminal R-wave in AVR
- AV block

Seizures:

- May be recurrent and persistent.
- May lead to hyperthermia and rhabdomyolysis
- Treat aggressively with benzodiazepines
- Avoid phenytoin as it worsens Na-channel dysfunction
- If paralysis is necessary to avoid rhabdo and hypothermia, be sure to perform continuous EEG monitoring

Diagnosis:

- Be suspicious of TCA overdose in a patient who is lethargic, has seizures in the presence of QRS prolongation on ECG.
- Drug levels are not helpful
- Treat based on clinical presentation

Evaluation of suspected TCA ingestion:

- 12-lead ECG
- BMP, CBC, UDS, ASA, APAP, U/A, CPK, CXR, VBG
- Continuous ECG monitoring

Treatment:

- Secure airway if obtunded
- Call poison center
- If QRS duration >120msec and HR >120, give NaHCO₃ bolus (1-2meq/kg) and start infusion.
- 1 amp of NaHCO₃ will increase pH by 0.1
- Goal is for pH 7.45 – 7.55
- Infusion of D5W with 3 amps of NaHCO₃ at 150cc/hr
- Sodium bicarbonate helps reverse the cellular membrane effects of the TCA by increasing extracellular Na concentrations and by direct effect of pH on the fast Na channel.
- Treat hypotension with NaHCO₃ with dose described above
- Consider glucagon and/or insulin-glucose for the treatment of hypotension in the patient with TCA overdose